

SEQUENCE LISTING

<110> Sano, Hiroshi
Kusano, Tomonobu
Koizumi, Nozomu

<120> Theobromine Synthase Polypeptide of Coffee Plant and the
Gene Encoding Said Polypeptide

<130> 026350-091

<140> (unassigned)

<141> 2004-03-18

<150> JP 2000-307,149

<151> 2000-10-06

<160> 22

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 378

<212> PRT

<213> *Coffea arabica*

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Ser	Tyr	Ala	Lys	Asn	Ala	Ser	Tyr	Asn	Leu	Ala	Leu	Ala	Lys	Val	Lys
		20						25					30		
Pro	Phe	Leu	Glu	Gln	Cys	Ile	Arg	Glu	Leu	Leu	Arg	Ala	Asn	Leu	Pro
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Asn	Ile	Asn	Lys	Cys	Ile	Lys	Val	Ala	Asp	Leu	Gly	Cys	Ala	Ser	Gly
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Pro	Asn	Thr	Leu	Leu	Thr	Val	Arg	Asp	Ile	Val	Gln	Ser	Ile	Asp	Lys
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Val	Gly	Gln	Glu	Glu	Lys	Asn	Glu	Leu	Glu	Arg	Pro	Thr	Ile	Gln	Ile
			85					90						95	
Phe	Leu	Asn	Asp	Leu	Phe	Gln	Asn	Asp	Phe	Asn	Ser	Val	Phe	Lys	Leu
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Gly	Ser	Cys	Leu	Ile	Ser	Ala	Met	Pro	Gly	Ser	Phe	Tyr	Gly	Arg	Leu
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Phe	Pro	Glu	Glu	Ser	Met	His	Phe	Leu	His	Ser	Cys	Tyr	Ser	Val	His
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Trp	Leu	Ser	Gln	Val	Pro	Ser	Gly	Leu	Val	Ile	Glu	Leu	Gly	Ile	Gly
			165					170						175	
Ala	Asn	Lys	Gly	Ser	Ile	Tyr	Ser	Ser	Lys	Gly	Cys	Arg	Pro	Pro	Val
		180					185						190		
Gln	Lys	Ala	Tyr	Leu	Asp	Gln	Phe	Thr	Lys	Asp	Phe	Thr	Thr	Phe	Leu
		195				200					205				
Arg	Ile	His	Ser	Lys	Glu	Leu	Phe	Ser	Arg	Gly	Arg	Met	Leu	Leu	Thr
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Cys	Ile	Cys	Lys	Val	Asp	Glu	Phe	Asp	Glu	Pro	Asn	Pro	Leu	Asp	Leu

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Glu Lys Leu Asp Ser Phe Asn Ile Pro Phe Phe Thr Pro Ser Ala Glu			
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Glu Val Lys Cys Ile Val Glu Glu Gly Ser Cys Glu Ile Leu Tyr			
	275	280	285
Leu Glu Thr Phe Lys Ala His Tyr Asp Ala Ala Phe Ser Ile Asp Asp			
	290	295	300
Asp Tyr Pro Val Arg Ser His Glu Gln Ile Lys Ala Glu Tyr Val Ala			
	305	310	315
Ser Leu Ile Arg Ser Val Tyr Glu Pro Ile Leu Ala Ser His Phe Gly			
	325	330	335
Glu Ala Ile Met Pro Asp Leu Phe His Arg Leu Ala Lys His Ala Ala			
	340	345	350
Lys Val Leu His Met Gly Lys Gly Cys Tyr Asn Asn Leu Ile Ile Ser			
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Leu Ala Lys Lys Pro Glu Lys Ser Asp Val			
	370	375	

<210> 2
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 <213> *Coffea arabica*

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ggtgaaacct	ttccttgaac	aatgcatacg	agaattgttg	cgggccaact	tgcccaacat	180
caacaagtgc	attaaagtgt	cggatttggg	atgcgcttct	ggaccaaaca	cacttttaac	240
agtgcgggac	attgtgcaaa	gtattgacaa	agttggccag	gaagagaaga	atgaattaga	300
acgtcccacc	attcagattt	ttctgaatga	tcttttccaa	aatgatttca	attcggtttt	360
caagttgctg	ccaagcttct	accgcaaact	cgagaaagaa	aatggacgca	agataggatc	420
gtgcctaata	agcgcaatgc	ctggctcttt	ctacggcaga	ctcttccccg	aggagtccat	480
gcattttttg	cactcttggt	acagtgttca	ttggttatct	caggttccca	gcggtttggt	540
gattgaattg	gggattgggt	caaacaaagg	gagtatttac	tcttccaaag	gatgtcgtcc	600
gcccgtccag	aaggcatatt	tggatcaatt	tacgaaagat	tttaccacat	ttctaaggat	660
tcattcgaaa	gagttgtttt	cacgtggccg	aatgctcctt	acctgcattt	gtaaagtaga	720
tgaattcgac	gaaccgaatc	ccctagactt	acttgacatg	gcaataaacg	acttgattgt	780
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gacttttaag	gccattatg	atgctgcctt	ctctattgat	gatgattacc	cagtaagatc	960
ccatgaacaa	attaaagcag	agtatgtggc	atcattaatt	agatcagttt	acgaacccat	1020
cctcgcaagt	cattttggag	aagctattat	gcctgactta	ttccacaggc	ttgcgaagca	1080
tgacagcaaag	gttctccaca	tgggcaaagg	ctgctataat	aatcttatca	tttctctcgc	1140
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 <212> PRT
 <213> *Coffea arabica*

<400> 3

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 35 40 45
 Pro Asn Ile Asn Lys Cys Ile Lys Val Ala Asp Leu Gly Cys Ala Ser
 50 55 60
 Gly Pro Asn Thr Leu Leu Thr Val Trp Asp Thr Val Gln Ser Ile Asp
 65 70 75 80
 Lys Val Lys Gln Glu Met Lys Asn Glu Leu Glu Arg Pro Thr Ile Gln
 85 90 95
 Val Phe Leu Thr Asp Leu Phe Gln Asn Asp Phe Asn Ser Val Phe Met
 100 105 110
 Leu Leu Pro Ser Phe Tyr Arg Lys Leu Glu Lys Glu Asn Gly Arg Lys
 115 120 125
 Ile Gly Ser Cys Leu Ile Ala Ala Met Pro Gly Ser Phe His Gly Arg
 130 135 140
 Leu Phe Pro Glu Glu Ser Met His Phe Leu His Ser Ser Tyr Ser Leu
 145 150 155 160
 Gln Phe Leu Ser Gln Val Pro Ser Gly Leu Val Thr Glu Leu Gly Ile
 165 170 175
 Thr Ala Asn Lys Arg Ser Ile Tyr Ser Ser Lys Ala Ser Pro Pro Pro
 180 185 190
 Val Gln Lys Ala Tyr Leu Asp Gln Phe Thr Lys Asp Phe Thr Thr Phe
 195 200 205
 Leu Arg Met Arg Ser Glu Glu Leu Leu Ser Arg Gly Arg Met Leu Leu
 210 215 220
 Thr Cys Ile Cys Lys Gly Asp Glu Cys Asp Gly Pro Asn Thr Met Asp
 225 230 235 240
 Leu Leu Glu Met Ala Ile Asn Asp Leu Val Ala Glu Gly Arg Leu Gly
 245 250 255
 Glu Glu Lys Leu Asp Ser Phe Asn Val Pro Ile Tyr Thr Ala Ser Val
 260 265 270
 Glu Glu Val Lys Cys Met Val Glu Glu Glu Gly Ser Phe Glu Ile Leu
 275 280 285
 Tyr Leu Gln Thr Phe Lys Leu Arg Tyr Asp Ala Gly Phe Ser Ile Asp
 290 295 300
 Asp Asp Cys Gln Val Arg Ser His Ser Pro Val Tyr Ser Asp Glu His
 305 310 315 320
 Ala Arg Ala Ala His Val Ala Ser Leu Ile Arg Ser Val Tyr Glu Pro
 325 330 335
 Ile Leu Ala Ser His Phe Gly Glu Ala Ile Ile Pro Asp Ile Phe His
 340 345 350
 Arg Phe Ala Thr Asn Ala Ala Lys Val Ile Arg Leu Gly Lys Gly Phe
 355 360 365
 Tyr Asn Asn Leu Ile Ile Ser Leu Ala Lys Lys Pro Glu Lys Ser Asp
 370 375 380
 Ile
 385

<210> 4

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<212> DNA

<213> *Coffea arabica* .

<400> 4

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agttgcagat ttgggatgcg cttccggacc aaacacactt ttaaccgttt gggacactgt 240
acaaagtatt gacaaagtta agcaagaaat gaagaatgaa ttagaacgtc ccaccattca 300
ggtttttctg actgatcttt tccaaaatga tttcaattcg gttttcatgc tgctgccaa 360

cttctaccgc aaacttgaga aagaaaatgg acgcaaaata ggatcgtgcc taatagccgc 420
aatgcctggc tctttccacg gcagactctt ccccgaggag tccatgcatt ttttactc 480
ttcttacagt cttcagtttt tatcccaggt tcccagcggg ttggtgactg aattggggat 540
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atatttggat caatttacga aagattttac cacattttta aggatgcgtt cggaagagtt 660
gctttcacgt ggccgaatgc tccttacttg catttgtaaa ggagatgaat gcgacggccc 720
gaataccatg gacttacttg agatggcaat aaacgacttg gttgctgagg gacgtctggg 780
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ttatgatgct ggcttctcta ttgatgatga ttgccaaagta agatccatt cccagtata 960
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gaatgcagca aaggttatcc gcttgggcaa aggccttctat aataatctta tcatttctct 1140
tgccaaaaaa ccagagaagt cagacatata aaagcttggt tttagttggg ttttgtgtta 1200
tgggttggtt tctgatacgg ggaaaggatt cagtgcgggt ggggttctat ccgagtattg 1260
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<210> 5

<211> 385

<212> PRT

<213> *Coffea arabica*

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Ser	Tyr	Ala	Lys	Asn	Ser	Ser	Phe	Asn	Gln	Leu	Val	Leu	Ala	Lys	Val
			20					25					30		
Lys	Pro	Val	Leu	Glu	Gln	Cys	Val	Gly	Glu	Leu	Leu	Arg	Ala	Asn	Leu
			35				40					45			
Pro	Asn	Ile	Asn	Lys	Cys	Ile	Lys	Val	Ala	Asp	Leu	Gly	Cys	Ala	Ser
			50				55				60				
Gly	Pro	Asn	Thr	Leu	Leu	Thr	Val	Arg	Asp	Ile	Val	Gln	Ser	Ile	Asp
65					70				75					80	
Asp	Val	Arg	Gln	Glu	Met	Lys	Asn	Glu	Leu	Glu	Arg	Pro	Thr	Ile	Gln
			85					90						95	
Val	Phe	Leu	Thr	Asp	Leu	Phe	Gln	Asn	Asp	Phe	Asn	Ser	Val	Phe	Met
			100					105					110		
Leu	Leu	Pro	Ser	Phe	Tyr	Arg	Lys	Leu	Glu	Lys	Glu	Asn	Gly	Arg	Lys
			115				120					125			
Ile	Gly	Ser	Cys	Leu	Ile	Ala	Ala	Met	Pro	Gly	Ser	Phe	His	Gly	Arg
			130				135				140				
Leu	Phe	Pro	Glu	Glu	Ser	Met	His	Phe	Leu	His	Ser	Ser	Tyr	Ser	Leu
145					150				155					160	
Gln	Phe	Leu	Ser	Gln	Val	Pro	Ser	Gly	Leu	Val	Thr	Glu	Leu	Gly	Ile
			165					170						175	
Thr	Ala	Asn	Lys	Arg	Ser	Ile	Tyr	Ser	Ser	Lys	Ala	Ser	Pro	Pro	Pro
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<211> 372

<212> PRT

<213> Caffea arabica

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Lys Pro Val Leu Glu Gln Cys Val Arg Glu Leu Leu Arg Ala Asn Leu

35 40 45

Pro Asn Ile Asn Lys Cys Ile Lys Val Ala Asp Leu Gly Cys Ala Ser

50 55 60

Gly Pro Asn Thr Leu Leu Thr Val Arg Asp Ile Val Gln Ser Ile Asp

65					70						75						80
I	H	S	C	C	I	E	S	C	I	E	S	C	I	E	S	C	I

Lys Val Gly Gln Glu Lys Lys Asn Glu Leu Glu Arg Pro Thr Ile Gln
 25 30 35

[illegible]

Ile Phe Leu Asn Asp Leu Phe Pro Asn Asp Phe Asn Ser Val Phe Lys
 100 105 110

100 105 110
Leu Leu Pro Ser Phe Tyr Arg Lys Leu Gly Lys Gly Asp Gly Arg Lys

Leu Leu His Ser Phe Tyr Arg Lys Leu Glu Lys Glu Asn Gly Arg Lys
115 120 125

Ile Gly Ser Cys Leu Ile Gly Ala Met Pro Gly Ser Phe Tyr Ser Arg

the	city	ser	cys	lea	the	city	lea	the	the	city	ser	the	city	ser	arg	
130					135					140						

Leu Phe Pro Glu Glu Ser Met His Phe Leu His Ser Cys Tyr Cys Leu

145	150	155	160
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Gln Trp Leu Ser Gln Val Pro Ser Glv Leu Val Thr Glu Leu Glv Ile

165 170 175

Ser Thr Asn Lys Gly Ser Ile Tyr Ser Ser Lys Ala Ser Arg Leu Pro

180 185 190

Val Gln Lys Ala Tyr Leu Asp Gln Phe Thr Lys Asp Phe Thr Thr Phe

195 200 205

Leu Arg Ile His Ser Glu Glu Leu Phe Ser His Gly Arg Met Leu Leu

210 215 220

Thr Cys Ile Cys Lys Gly Val Glu Leu Asp Ala Arg Asn Ala Ile Asp

225 230 235 240

Leu Leu Glu Met Ala Ile Asn Asp Leu Val Val Glu Gly His Leu Glu
245 250 255

				245					250					255				
G ₁	G ₁	I	I	R	S	P ₁	T	J	R	H ₁	F	E ₁	D	C	L ₁			

Glu Glu Lys Leu Asp Ser Phe Ash Leu Pro Val Tyr Ile Pro Ser Ala
260 265 270

260 265 270
Gly Gly Val Leu Cys Ile Val Gly Gly Gly Gly Ser Phe Gly Ile Leu

Glu Glu Val Lys Cys Ile Val Glu Glu Glu Gly Ser Phe Glu Ile Leu
275 280 285

Tyr Leu Gly Thr Phe Lys Val Leu Tyr Asp Ala Gly Phe Ser Ile Asp

Arg	Leu	Glu	Thr	Phe	His	Val	Leu	Arg	Asp	Ala	Gly	Phe	Ser	Thr	Asp
	290					295					300				

Asp Glu His Ile Lys Ala Glu Tyr Val Ala Ser Ser Val Arg Ala Val

305					310						315					320
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Tyr Glu Pro Ile Leu Ala Ser His Phe Gly Glu Ala Ile Ile Pro Asp

325 330 335

Ile Phe His Arg Phe Ala Lys His Ala Ala Lys Val Leu Pro Leu Gly

340 345 350

Lys Gly Phe Tyr Asn Asn Leu Ile Ile Ser Leu Ala Lys Lys Pro Glu

355 360 365

Lys Ser Asp Val

370

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 <211> 1316
 <212> DNA
 <213> *Coffea arabica*

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 aactggttct cgccaagggtg aaacctgtcc ttgaacaatg cgtacgggaa ttgttgcggg 180
 ccaacttgcc caacatcaac aagtgcatta aagttgcgga tttgggatgc gcttctggac 240
 caaacacact tttaacagtt cgggacattg tccaaagtat tgacaaagtt ggccaggaaa 300
 agaagaatga attagaacgt cccaccattc agatttttct gaatgatctt ttcccaaagt 360
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 gacgcaaaat aggatcgtgc ctaatagggg caatgcccg ctctttctac agcagactct 480
 tccccgagga gtccatgcat tttttacact ctgtttactg tcttcaatgg ttatctcagg 540
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 ccaaagcaag tcgtctgccc gtccagaagg catattttga tcaatttacg aaagatttta 660
 ccacatttct aaggattcat tcggaagagt tgttttcaca tggccgaatg ctcttactt 720
 gcatttgtaa aggagttgaa ttagacgccc ggaatgccat agacttactt gagatggcaa 780
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 aacatattaa agcagagtat gttgcatctt ccgttagagc agttttacgaa cccatcctcg 1020
 caagtcattt tggagaagct attatacctg acatattcca caggtttgcg aagcatgcag 1080
 caaaggttct ccccttgggc aaaggcttct ataataatct tatcatttct ctgcgcaaaa 1140
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 ttgggggtct ttcgggtatt gtgcttttta tattatattg ttttgtatcc gtaataaaa 1260
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<400> 9
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23

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arnyknyyrt rraanswncc ngg

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1 5

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1 5

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Pro Gly Ser Phe His Lys Asn Leu Phe
1 5

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Pro Gly Ser Phe Tyr Gly Arg Leu Phe
1 5

<210> 20
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Pro Gly Ser Phe Tyr Lys Arg Leu Phe
1 5

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Pro Gly Ser Phe Tyr Gly Asn Leu Phe
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<213> Arabidopsis thaliana

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Pro Gly Ser Phe Tyr Lys Asn Leu Phe

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